

# Ambient EM-Powered Acoustic Resonators Embedded Within Cookware and Flatware to Prevent Adhesion of Food Particles Without Chemical Coatings

26 December 2022

Simon Edwards

Research Acceleration Initiative

## Introduction

Non-Stick coatings and the chemical precursors needed to produce them have caused untold millions to suffer from chronic disease. Consumers are looking for reasonably-priced alternatives that achieve the goal of preventing food from drying to surfaces as effectively or more effectively than chemical coatings.

## Abstract

An existing, simple technology without moving parts may be incorporated into porcelain plates, for instance, as well as in metal cookware in order to prevent the adhesion of food particles to their surface. In the case of metal, only a slight modification is needed to enable the process.

The technology that may help achieve this objective are the metallic filaments currently used to support ultrasonic acoustic generation for anti-theft applications in retail outlets. By embedding hundreds of these filaments in the porcelain of a dinner plate, for instance, ambient EM can be converted directly into ultrasonic acoustic energy. This process is known as magnetostriction.

Most households have ambient electromagnetism in abundance. Wireless routers, cell phones, and EM from your local cell tower are potential sources of energy to support this application. Ordinarily, a special powered emitter is needed within a few feet of filaments to generate sufficient electrical current in the filaments for an audible sound to be generated. With many, smaller filaments, however, it may be possible to generate just enough phononic activity to prevent food particles from drying to a surface.

The reason this is possible is because food particles, once entirely desiccated, if dropped onto a plate do not stick to the plate. Molecular adhesion can only occur when a wet material is applied and dries while maintaining contact with the surface. While the smoothness of a surface will affect adhesion up to a certain point, a far greater factor in determining the tendency toward strong molecular bonds is the presence or absence of vibrational energy. If a surface is constantly vibrating, wet material; tomato sauce, for instance; will not have a chance to form a bond.

These bonds are not based upon micro-crevices, as is widely believed; a belief promoted by the DuPont company over the years; but rather, raised peaks in material around which carbon compounds latch on to as they dehydrate and therefore contract. If this contraction happens before the carbon compounds can situate themselves around the spikes (like a horseshoe around a pole) the adhesion patterns that make dish cleaning a challenge will not present

themselves as food would be less prone to sticking than with even a chemical non-stick coating.

As long as a surface is in constant, relative motion, no matter how small the increment, no food will stick to that surface. Metal filaments will to some degree deform and vibrate as the result of any absorbed electricity from EM.

## **Conclusion**

Filaments would actually need to be coated in a thin layer of ceramic before the overall structures are added to stainless steel cookware to ensure that the effect was not dampened by the surrounding metal. Similar principles would apply to utensils, or any other surface one wishes to remain repellent to soil.